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| 10/608,391 | 06/26/2003 | Kenji Yamagami | 16869B-082700US | 8386 |

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| EXAMINER |
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PATEL, HETUL B

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| ART UNIT | PAPER NUMBER |
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2186

DATE MAILED: 08/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/608,391

Applicant(s)

YAMAGAMI, KENJI

Examiner

Hetul Patel

Art Unit

2186

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 June 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 8-10, 15-28, 30 and 31 is/are rejected.
- 7) ☒ Claim(s) 6, 7, 11-14 and 29 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 June 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 10/02/2003.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-31 are presented for examination.
2. The IDS filed on 10/02/2003 has been received and carefully considered.

Specification

3. The abstract is objected to because of the following informalities:
It should be stated as "... at least one snapshot ..." instead of "... at lease one snapshot ..." in the first line of the abstract.
Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dettinger et al. (USPN: 2004/0225689) hereinafter, Dettinger in view of Mattson et al. (USPN: 5,551,003) hereinafter, Mattson.

As per claim 1, Dettinger teaches a method for processing data in an application data store comprising producing at least a first snapshot (the log file 222 in Fig. 2) of an application data store, the application data store configured to receive data by way of

write operations issued from a host device (the processor 112 in Fig. 1); producing a journal entry (the log file entry 220 in Fig. 2) for each write operation issued from the host device; storing each journal entry in a journal data store, thereby accumulating a list of journal entries; monitoring an amount of free space on the journal data store; and when the free space falls below a first threshold value (i.e. when the maximum file size is reached), then removing one or more journal entries from the journal data store, thereby increasing the free space, i.e. by overwriting the earlier/old file entries (e.g. see paragraph [0006] and Figs. 1-2).

However, Dettinger does not teach about using the second threshold value. Mattson, on the other hand, teaches about starting garbage collecting when the number of the free space segments is less than a first threshold value and continuing the garbage collection until the number of the free space segments exceeds the second threshold value (e.g. see claim 1). Accordingly, it would have been obvious to one of ordinary skill in the art at the time of the current invention was made to use both the first and second threshold values as taught by Mattson in Dettinger's method. In doing so, not only the minimum amount of free space is always present by using only the first threshold value but also it would not exceed the second threshold value so it would avoid removing/deleting the extra journal entries than required, i.e. as set by the second threshold value.

As per claims 8, 15, 18, 21, 26, 28 and 30, see arguments with respect to the rejection of claim 1. Claims 8, 15, 18, 21, 26, 28 and 30 are also rejected based on the same rationale as the rejection of claim 1.

As per claim 2, the combination of Dettinger and Mattson teaches the claimed invention as described above and furthermore, Dettinger teaches that in the “wrapping” approach, removing one or more journal entries includes updating the first snapshot by applying one or more journal entries (log entries) to the first snapshot, beginning with an oldest journal entry, wherein journal entries applied to the first snapshot are removed from the list of journal entries thereby increasing the free space of the journal data store (e.g. see paragraph [0006]).

As per claim 3, the combination of Dettinger and Mattson teaches the claimed invention as described above and furthermore, Dettinger teaches that removing one or more journal entries (log entries) includes identifying a selected snapshot (the log file) that is earlier in time than an oldest journal entry and is closest in time to the oldest journal entry than other snapshots and updating the selected snapshot with one or more journal entries beginning with the oldest journal entry (e.g. see paragraph [0006]).

As per claim 4, the combination of Dettinger and Mattson teaches the claimed invention as described above and furthermore, Dettinger teaches that removing one or more journal entries includes looking for a most recent snapshot, removing journal entries in the journal data store that are earlier in time than the most recent snapshot, i.e. in other words, removing the older/earlier log entries to write the new/most recent log entries (e.g. see paragraph [0006]).

As per claim 5, the combination of Dettinger and Mattson teaches the claimed invention as described above and furthermore, Mattson teaches that the first threshold

value (which is smaller) and the second threshold value (which is larger) are different (e.g. see Col. 5, lines 61-67).

As per claim 25, see arguments with respect to the rejection of claim 5. Claim 25 is also rejected based on the same rationale as the rejection of claim 5.

As per claim 9, the combination of Dettinger and Mattson teaches the claimed invention as described above and furthermore, Mattson teaches the step of updating includes periodically monitoring the free space of the journal data store and if the free space falls below a first threshold then updating the at least first snapshot (e.g. see Col. 1, lines 33-39).

As per claim 31, see arguments with respect to the rejection of claim 9. Claim 31 is also rejected based on the same rationale as the rejection of claim 9.

As per claim 10, the combination of Dettinger and Mattson teaches the claimed invention as described above and furthermore, Mattson teaches the step of updating the at least first snapshot is repeated for a number of journal entries so that the free space rises above a second threshold value (e.g. see claim 1).

As per claims 16, 23 and 24, the combination of Dettinger and Mattson teaches the claimed invention as described above and furthermore, Dettinger teaches that the selected snapshot is earlier in time than the oldest journal entry and closest in time to the oldest journal entry than other snapshots, i.e. the selected log file is earlier than the oldest log entry and closest to the oldest log entry than the other log files (e.g. see paragraph [0006]).

As per claims 17 and 19, the combination of Dettinger and Mattson teaches the claimed invention as described above and furthermore, Dettinger teaches that the method further comprising associating sequence numbers to the snapshots and to the journal entries, wherein the selected snapshot is associated with a sequence number that is greater than a sequence number associated with an oldest journal entry by a predetermined amount, i.e. the selected log file is older than the oldest log entry; and wherein the selected snapshot is determined based on the sequence numbers of the snapshots and the sequence number of the oldest journal entry, i.e. the selected log entry is determined based on how old the log file and log entry is (e.g. see paragraph [0006]).

As per claim 20, the combination of Dettinger and Mattson teaches the claimed invention as described above and furthermore, Dettinger teaches in the “wrapping” approach, journal entries (the log entries) are sequentially allocated and contiguously arranged in the journal data store in a manner representative of a sequential list of journal entries, wherein the step of storing includes wrapping to a beginning of the list of journal entries (the log file) to reuse earlier journal entries when an end of the list of journal entries is reached (e.g. see paragraph [0006]).

As per claims 22, the combination of Dettinger and Mattson teaches the claimed invention as described above and furthermore, Dettinger teaches that the step of recording is initiated prior to producing a snapshot, so each write operation that issues during a period of time that a first snapshot is being produced will be recorded in a

journal entry, i.e. writing a log entry in the log file for each write request from the processor (e.g. see paragraph [0006] and Figs. 1-2).

As per claim 27, the combination of Dettinger and Mattson teaches the claimed invention as described above and furthermore, Dettinger teaches that if a determination is made to apply some of the journal entries (log entries) to one of the snapshots (log file), then identifying an oldest journal entry, i.e. the oldest log entry; identifying a selected snapshot based on a sequence number associated with the oldest journal entry and on sequence numbers associated with the snapshots; and updating the selected snapshot with one or more journal entries, beginning with the oldest journal entry, i.e. updating the log file by replacing one or more oldest log entries with one or more new log entries (e.g. see paragraph [0006] and Figs. 1-2).

Allowable Subject Matter

5. Claims 6-7, 11-14 and 29 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hetul Patel whose telephone number is 571-272-4184. The examiner can normally be reached on M-F 8-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matt Kim can be reached on 571-272-4182. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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MATTHEW D. ANDERSON
PRIMARY EXAMINER